(D) REMARKS

REJECTION RE INFORMALITIES

In Para. 1 of the Action, claim 6 is objected to regarding the word "electronic." The amendment herein makes this point moot and withdrawal of the rejection is respectfully requested.

REJECTIONS UNDER SEC. 102 and 103

In Para. 2 and 3 of the Action, independent claim 1, claims 2-6 depending therefrom, and independent claim 6 were rejected as anticipated by U.S. Pat. No. 6,473,072 B1 (Comiskey et al.) under Sec. 102(e). Comiskey et al. does not teach the present invention under Sec. 102 nor does it read on the claims of the present application.

A valid rejection on the ground of anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. Soundscriber Corp. v. U.S., 148 USPQ 298, 301 (1966); In re Donohue, 226 USPQ 619, 621 (Fed. Cir. 1985).

Even a cursory reading of Comiskey et al. evidences in it's own words that it is a "microcapsule" technology display. The present application for an "Electronic Writing and Erasing Pencil" clearly differentiates this type of technology in its Background section. In a fundamental aspect, single-molecule, molecular-level, switches that can be individually accessed are disclosed in the embodiments described and claimed in the present application. Sometimes known as "nanotechnology," such single molecule switches are many, many orders of magnitude smaller than any microcapsule that can be fabricated. What will be recognized by those skilled in the art is that applicants' claimed "molecular colorant" (see independent claims 1, 7, 12) clearly is distinguished from any "microcapsule" based ink such as shown in the cited reference. The specification in the Background section and the Appendix evidence the clear distinctions. Summarized succinctly, microcapsule technology is not the nanotechnology of the present invention nor analogous thereto. It is not a case of mere miniaturization, it is a fundamental conceptual difference in way, means and results. More specifics with respect to other cited references are detailed hereinafter

First however, it is to be noted that the Action alleges at Page 3, that the

> "...the language of claims 6 and 11 does not invoke sixth paragraph of 35 U.S.C. Sec 112, and therefore the examiner gives the term "molecular" the broadest possible interpretation,... ."

The Action argument is flawed. Given the Webster's II, New Riverside Dictionary[1] definitions:

> "molecule . . . The simplest structural unit that has the characteristic physical and chemical properties of a compound."

and

> "molecular . . .Of, relating to, or caused by molecules.":

microcapsule-based colorants such as in Comisky can not be said with technological accuracy to be equivalent to "molecular colorant."

Claims do not have to include "means for" language to be required to be read in view of the specification from which they derive antecedent basis. It is axiomatic that claims are not to be interpreted in a vacuum. Slimfold Mfg. Col v. Kinkead Indus.,810 f.2d 1113, 1 USPQ 2d 1563 (Fed. Cir. 1987); Moleculon Res. Corp. v. CBS, Inc., 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986). The claim and specification language must be considered. DMI, Inc. v. Deere & Co., 755 F.2d 1570, 225 USPQ 236 (Fed. Cir. 1985). By ignoring the present application's use of the claims limitations as discussed in the Detailed Description, the argument as set forth in the Action ignores this requirement. Understanding, or Interpreting, a limitation *already in a claim* in light of the Detailed Description is not the same as an impermissible reading of a limitation into a claim. Otherwise, these court decisions are rendered meaningless. Withdrawal of the rejection is respectfully requested.

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[1] Houghton Mifflin Co., Boston NY, copr. 1996

In Para. 4 of the Action, dependent claims 7-9 and 11 are rejected under Sec. 102(b) as anticipated by Hashimoto, JP 63-201815 (Nobuaki display). In Para. 5 and 6, dependent claim 10 is rejected in view of Hashimoto JP 63-201815 combined with Hashimoto, JP 63-192123 (also referred to as "Nobuaki").

A dependent claim includes all the limitations of the claim from which it depends and, as such, makes specific that which was general. 35 U.S.C. 112; 37 C.F.R. Sec. 1.75(c); Allen Group, Inc. V. Nu-Star, Inc., 197 USPQ 849 (7th Cir. 1978); Ex parte Hansen, 99 USPQ 319 (Pat. Off. Bd. App. 1953). Dependent claims are non-obvious if the independent claims from which they depend are non-obvious. In re Fine, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988); *see also* Hartness International, Inc. V. Simplimatic Engineering Co., 2 USPQ2d 1826, 1831 (Fed. Cir. (1987) to the same effect re novelty). Thus, allowance of a base claim as patentable normally results in allowance of a claim dependent upon that claim. Withdrawal of the rejection of the dependent claims is respectfully requested.

Applicant also notes that neither a finding of anticipation nor obviousness can be supported by the referenced patents.

The Nobuaki display device relies on a liquid crystal light valve in concert with an electric field producing Nobuaki pen. The present invention introduces a molecular color switch in concert with an electric field producing writing and erasing pencil.

The liquid crystal display of Nobuaki, and other similar known manner devices, comprises several optical functional layers that collectively block or transmit light through the display via a field switchable physical orientation of crystals in a liquid layer sandwiched on each side by polarizer plates. In one orientation, the liquid crystals allow light transmission through the adjoining polarizer plates. In the other orientation, the liquid crystals block light transmission through the polarizer plates. The pen is used to pixel-wise orient the crystals to form an image across the display surface, in this case an image of blocked and transmitted light pixels. In no aspect of the Nobuaki invention is there a fundamental color change of any component of the display in producing an image. The components collectively produce only a light valve.

By contrast, the present operative with molecular colorant images by manipulating the fundamental color of molecules through an electric field as described in depth in the Appendix of the present application. Color switching occurs through controlling the degree of electron conjugation across each molecule. Whereas the Nobuaki display controls the physical orientation of macrochemicals, the present invention controls the electron structure of individual molecules.

A color switch developed according to the teachings of the present invention allows a single, thin, print-like, solid state colorant layer for the display device. The Nobuaki display, by comparison, requires a far more cumbersome and restrictive liquid layer, spacers, two polarizer plate layers and seal. In addition to inherent benefits of our invention in paper-like flexibility and simplicity of manufacture, our invention also has inherent benefit in image resolution. This is because the lower limit in pixel-wise dimension of the electric field that writes the image is defined and proportionate to the spacing between the electrodes. The relatively larger distance between the electrodes in the Nobuaki display, incurred by the inclusion of three relatively thick layers (liquid crystal layer and two polarizer plates), necessitates inherently lower resolution than that offered by the single, thin layer of the present invention.

Note that a display for use in accordance with the molecular colorant pencil in accordance with the present invention also has inherently greater image contrast and writing speed over that of Nobuaki. Polarizers work by absorbing light that is not polarized in line with the polarizer. It is well known that two polarizers, such as used by Nobuaki, in combination absorb about 50% of the light that impinges a liquid crystal display. This greatly reduces the intensity difference between blocked and transmitted light in the image. This is why liquid crystal displays are hard to read (as with wristwatches) unless backlit. By comparison, in accordance with the present invention, a display has no other optical components beyond the molecular switch layer. The intensity difference between absorbed and transmitted light is, thereby, significantly greater in our device. This allows our colorant layer to have identical optical (contrast) properties to standard print. The Nobuaki light valve is controlled by physically reorienting a macromolecule in a liquid medium. The time and energy required to cause this orientation is significantly greater than that required to move the electrons in our molecule. Liquid crystal displays, by nature, invoke a technical trade-off between contrast and speed. Larger crystals are required for higher

contrast, but require larger fields and time to switch orientation. This is why liquid crystal video displays often show tails behind moving objects in the image. Analogous speed limitations are thereby imposed on the Nobuaki device. The lower switching speed will restrict the allowable traversing speed of the pen across the Nobuaki display to effect writing. By comparison, our molecular switch switches in nanoseconds, fully non-restricting to any humanly controlled pen speed.

The Nobuaki pen does not teach fringe field erase-write capability. The greater thickness of the Nobuaki display would likely make fringe field read-write impractical (too large a field required for a user safe solution). A fringe field produced by the Nobuaki pen would first need to penetrate the relatively thick, relatively low dielectric constant polarizer film, then be trained to return through the liquid layer - a difficult field design task as well. The fact that our switchable molecular colorant layer is thin and available to or very near the pen electrode surface makes fringe field erase-write feasible. In the fringe field read-write case, our invention does not require a back electrode as does Nobuaki.

Thus, it must be recognized that one does not make what is in fact simply jump from macrochemistry to nanotechnology via simple consideration of the former and making "obvious" adaptations. The rejections based on the Hashimoto JP patents should also be withdrawn as not material to the claims.

Further, at Page 4, second full para., while the Examiner indicates he is not relying upon other references, there is an intimation that presumably, Gimzewski et al. cited, teaches somewhat similar technology. In order to further prosecution, the applicants respond as follows.

Gimzewski et al's molecular system and Applicants' systems such as described in the Appendix and claimed in Claim 18 of the present application are total different systems even though both are dealing with molecular configuration or conformation changes influenced by external force. Gimzewski et al's system involves a center unit (**1** in Figs. 1a-b) with two or more legs (**3** in Figs. 1a-b) moving upwards or downward toward the bottom electrode (**4** in Figs. 1a-b] under the influence of external forces (usually mechanical or electrical mechanical forces exerted by a probe; see Figs. 1a-c and the discussion associated therewith). The legs **3** used in their system will only provide bi-stability for the two molecular configuration states. Their configuration (or conformation changes), standing up or lean-down, will not alter any electrical or optical properties of the center portion **1** of the molecule (or the entire molecule). As the matter of fact,

in their entire patent, they never mention or claim that those legs have to be part of the total conjugate system and they never mention or claim that those legs' movement will alter (or change) the electron-de-localization over the entire molecule or molecular band-gap. In their system, they might observe some change on electrical conduction of the monolayer, but it is purely due to the change of electrical tunneling distance between the center unit **1** and the bottom electrode **4**, and nothing to do with the band-gap change of the molecule. Therefore, the application of Gimzewski et al. would be incorrect.

In Summary, the cited references are not material to the claims. All rejections should be withdrawn.

Questions or suggestions that will advance the case to allowance may be directed to the undersigned by teleconference at the Examiner's convenience.

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Respectfully submitted,

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[2] All correspondence should continue to be addressed as per the Declaration.